TABLE 105
Impact of robotics technology on worker types, by industry: 2016–18
(Number and percent)

Industry				Production	on w	orkers			N	lonprodι	uctio	n worker	s				Supervisory	y w	orkers			Nonsupervisory workers						
	NAICS code	Companies (number)		ed Decreas		Did not change		-	ased	Decrea	sed	Did not change			Increas	ed	Decreased		oid not hange				sed	Decreas	sed	Did not change		
All industries	11, 21- 23, 31- 33, 42-81	88,422	8.1	6.6		63.3	22.0	5.	7	2.5		73.3	18.5		4.9		2.4		75.1	17.	6	5.5		2.8		73.8	17.9)
Manufacturing industries	31-33	20,540	11.3	13.1		71.8	3.8	9.	2	3.5		82.7	4.6		7.1		3.4		85.3	4.	2	7.8		4.2		82.8	5.2	2
Food	311	1,051	11.0	r 28.7		56.6	3.6	r 14.	כו	1.1		81.0	3.9	r	9.9	r	3.3	r	82.9	3.	9	r 7.1	r	6.9	r	77.8	8.1	ı
Beverage and tobacco products	312	423	23.6	r 22.9	r	50.7	2.8	r 13.	2 r	1.9	r	79.9	5.0	r	12.8	r	3.3	r	77.3	6.	6	r 21.7	r	3.1	r	69.8	5.4	1
Textile, apparel, and leather products	313- 16	378	9.8	r 21.2	r	67.5	D	9.) r	17.8	r	73.2	0.0		5.3	r	15.3	r	79.3	0.	0	8.7	r	3.7	r	75.1	12.4	1
Wood products	321	650	7.5	r 20.3	r	71.2	D	0.	9	D		92.5	6.5		0.8		D		94.3	3.	8	r 1.4	r	9.1	r	84.6	4.9)
Paper	322	311	3.2	24.1	r	70.4	D	3.	2	D		94.2	D		2.6		D		95.2		D	1.3	r	1.9		94.9)
Printing and related support activities	323	680	7.5	r 10.0		81.1	1.5	r 9.	3 r	D		84.7	5.7		4.0	r	0.0		92.9	3.	1	5.3	r	1.5	r	80.3	12.9)
Petroleum and coal products	324	23	17.4	D		73.9	0.0	17.	4	D		73.9	r 0.0		D		D		78.3	r 0.	0	17.4		D		73.9 r	0.0)
Chemicals	325	628	9.9	12.2		74.4	3.5	r 8.	1	2.9	r	83.3	5.7	r	5.6	r	D		88.1	5.	6	r 9.4		2.9	r	82.0	5.7	7
Pesticide, fertilizer, and other agricultural chemical manufacturing	3253	40	0.0	12.8		87.2	0.0	0.	ס	0.0		65.0	r D		0.0		0.0		65.0	r	D	0.0		D		57.5 r)
Pharmaceuticals and medicines	3254	143	5.6	r 11.2	r	81.8	D	7.	r	D		91.6	0.0		5.6	r	D		93.7	0.	0	7.0	r	D		85.3	0.0)
Soap, cleaning compound, and toilet preparation manufacturing	3256	158	4.4	8.9	r	81.6	D	7.	5 r	D		83.5	D		3.8		0.0		88.7	7.	6	r D		D		88.6	7.6	5
Other chemicals	other 325	288	16.3	14.9	r	65.6	D	10.	1 r	D		82.3	D		8.0	r	D		87.8		D	15.6		D		79.9)
Plastics and rubber products	326	1,817	14.0	20.8		64.4	0.8	19.	7	4.3	r	75.0	1.0		14.5		4.1 r	r	80.5	0.	9	19.6		6.9	r	71.1	2.4	ı
Nonmetallic mineral products	327	476	9.2	27.0		59.3	4.6	6.	1	0.8		84.5	8.6	r	16.0	r	2.1	r	74.2	7.	8	r 3.2		7.6	r	81.7	7.6	5
Primary metals	331	532	6.0	r 4.5		82.8	6.6	r 6.	4	D		86.3	6.6	r	3.4	r	D		88.0	8.	1	r 4.9		D		87.8	6.6	∫ز

TABLE 105
Impact of robotics technology on worker types, by industry: 2016–18
(Number and percent)

				Production	n work	ers			1	Nonprodu	uctio	n worker	s		Supervisory workers								Nonsupervisory workers						
Industry	NAICS code	Companies (number)		d Decrease		not nge	Did no		ased	Decrea	sed	Did not			Increase	d	Decrease	ed	Did not change	Did n		Increase	ed [Decreas	ed	Did not change	Did not		
Fabricated metal products	332	5,100	8.2	8.5	79.	2	4.1	r 5.	9	2.2	r	88.1	3.8		4.9		2.0	r	88.9	4.2		4.6		3.0	r	88.8	3.6		
Machinery	333	3,190	13.8	9.7	72.	6	3.9	r 12.	9	2.0	r	80.3	4.8		10.9		3.5	r	82.5	3.1	r	8.6		3.1	r	83.5	4.8		
Computer and electronic products	334	1,318	13.4	10.7	65.	6	10.2	6.	2 r	4.1	r	80.2	9.5		5.5		3.4	r	83.2	7.9		5.6		2.7	r	82.5	9.1		
Communications equipment	3342	75	D	D	48.	0	D	0.	0	0.0		86.7	D		D		0.0		80.0	D		0.0		0.0		86.7	D		
Semiconductor and other electronic components	3344	498	11.6	13.1	68.	2	7.2	r 6.	8 r	5.4	r	81.3	6.4	r	6.0	r	5.2	r	80.8	8.0	r	4.6		1.4	r	87.6	6.4		
Navigational, measuring, electromedical, and control instruments	3345	589	16.5	r 8.5	67.	7	7.3	r 6.	8 r	4.6	r	80.0	8.5	r	5.8	r	3.6	r	84.1	6.5	r	7.3	r	4.4	r	80.2	8.0		
Other computer and electronic products	other 334	156	7.1	r 7.1	r 56.	7	29.0		D	D		74.4	21.2	r	5.1	r	0.0		86.5	D		3.8	r	3.2		72.9	20.0		
Electrical equipment, appliances, and components	335	432	25.3	11.3	r 59.	7	3.7	22.	5	4.4	r	71.8	D		7.4		D		83.1	7.2	r	20.6		3.0	r	72.9	3.5		
Transportation equipment	336	1,157	10.9	11.2	75.	2	2.7	9.	5	9.3	r	78.5	2.7		6.7	r	7.1	r	82.8	3.4	r	11.6	r	3.4		81.7	3.3		
Automobiles, bodies, trailers, and parts	3361- 63	940	8.7	12.0	77.	6	1.7	8.	0	10.4	r	79.4	2.2		6.1	r	7.7	r	84.1	2.1		10.6	r	2.8		83.9	2.7		
Aerospace products and parts	3364	155	16.7	7.1	r 66.	0	10.2	r 14.	8	D		77.4	6.5	r	4.5	r	D		80.6	12.9	r	13.9		5.7	r	74.0	6.4		
Other transportation	other 336	62	D	D	64.	5 r	0.0		D	D		69.4	r 0.0		D		D		67.7 r	0.0		D		D		64.5 r	D		
Furniture and related products	337	881	8.6	16.6	70.	6	4.3	r 6.	0	12.4	r	74.3	7.2		3.1	r	11.8	r	79.5	5.6		4.7		12.9	r	77.9	4.5		
Miscellaneous	339	1,492	15.3	7.9	73.	2	3.6	3.	4	2.9	r	87.1	6.6		2.4	r	2.7	r	89.3	5.6		2.5		3.3		89.3	4.9		
Medical equipment and supplies	3391	854	22.8	6.9	66.	6	3.7	2.	0	4.6	r	86.6	6.8		0.9		2.6	r	90.4	6.1		1.5		3.5	r	89.7	5.3		
Other miscellaneous manufacturing	3399	639	5.3	9.4	82.	0	3.3	5.	2	0.9		87.5	6.4		4.5	r	2.7	r	87.8	4.9		3.8		2.8	r	89.1	4.2		

TABLE 105
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(Number and percent)

				Production workers					Nonprod	uctio	n worker	s			Supervisory	workers		Nonsupervisory workers						
Industry	NAICS code	Companies (number)		ncreased Decrea		Did not change		Increased	Decrea	sed	Did not change			Increased	Decreased	Did not change			ncreased	Decre	asec	Did not change	1 .	
Nonmanufacturing industries	11, 21- 23, 42-81	67,883	7.1	4.6		60.8	27.5	4.7	2.2		70.4	22.7		4.2	2.2	71.9	21.7		4.8	2.3	3	71.2	21.7	
Agriculture, forestry, fishing, and hunting	11	259	0.0	35.4	r	64.6	0.0	0.0	D		62.9	r D		0.0	D	78.8	D		0.0	0.0)	78.4	D	
Mining, extraction, and support activities	21	233	3.0	r 3.4		93.1	D	D	D		72.5	26.6	r	0.0	D	96.6	D		D	2.		92.7	D	
Utilities	22	36	0.0	13.9		55.5	30.6 r	0.0	D		77.8	r D		0.0	D	72.2	r D		0.0	[)	66.7	D	
Construction	23	7,354	6.4	6.1		60.4	27.1	4.7	2.4		73.0	19.9		4.7	3.8	72.5	19.0		5.9	2.4	1 1	71.9	19.8	
Wholesale trade	42	5,924	6.7	6.7		65.4	21.2	4.6	1.6	r	75.1	18.7		4.2	2.6	74.8	18.4		6.0	1.	7 1	73.5	18.8	
Retail trade	44-45	10,449	8.7	8.6		57.7	25.0	5.3	4.9		71.5	18.3		5.3	3.6	75.5	15.6		3.9	3.	5	76.1	16.5	
Transportation and warehousing	48-49	983	4.6	r 2.2	r	76.3	16.9	2.2	2.0	r	79.3	16.5		5.6 r	1.7 r	76.9	15.8		2.5	1.9) 1	79.3	16.3	
Information	51	1,513	7.0	1.6	r	62.6	28.8	5.5	1.9	r	66.8	25.8		8.3	0.5 r	66.9	24.4		5.9	3.8	3 1	65.9	24.4	
Publishing	511	409	10.0	r D		54.8	34.5	10.0	r D		51.3	37.9	П	9.0 r	D	57.9	32.8		9.3 ı	. [)	58.7	31.5	
Newspaper, periodical, book, and directory publishers	5111	97	D	D		74.2	16.5 r	D	D		56.7	37.1	r	D	D	76.3	16.5	r	D	[)	79.4	13.4	
Software publishers	5112	312	11.5	r D		48.4	39.7	12.5	0.0		49.5	37.9		11.1 r	0.0	51.6	37.3		11.8	0.0)	51.5	36.6	
Telecommunications	517	110	28.2	r 0.0		30.0	41.8	D	D		66.4	23.6	r	9.8 r	0.0	67.0	23.2	r	D	[)	53.6	25.5	
Data processing, hosting, and related services	518	316	9.5	r D		65.2	20.3	7.0	D		67.7	20.6		19.0 r	D	63.6	16.8		8.5	10.8	3 1	64.9	15.8	
Other information	other 51	676	D	D		71.6	27.5	1.8	1.0		75.9	21.3		2.5 r	D	74.0	23.1		2.2			72.9	24.1	
Finance and insurance	52	1,529	3.7	r 1.1		59.2	36.0	7.2	0.5		65.0	27.3		3.8 r	0.2	65.6	30.4		3.7 ı	3.:	2 1	67.5	25.6	
Real estate and rental and leasing	53	1,244	D	D		57.0	32.0	D	7.0	r	72.3	17.4		D	D	71.3	21.9		D	[75.7	17.4	
Lessors of nonfinancial intangible assets (except copyrighted works)	533	0	0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0		0.0	0.0)	0.0	0.0	

TABLE 105
Impact of robotics technology on worker types, by industry: 2016–18
(Number and percent)

					Production workers					N	lonprodu	uctio	n worker	s			Superviso	ory w	vorkers	Nonsupervisory workers					
Industry	NAICS code	Companie (number		reased	Decreas	sed	Did not			sed	Decrea	sed	Did not change			Increased	Decrease		Did not change	Did not employ	1	Decreased	Did not change		
Other real estate and rental and leasing	other 53	1,244		D	D		57.0	32.0	D		7.0	r	72.3	17.4		D	D		71.3	21.9	D	D	75.7	17.4	
Professional, scientific, and technical services	54	15,401	7	7.9	1.8		59.9	30.4	4.1		0.8		70.6	24.5		3.5	0.6		73.2	22.7	4.3	0.8	72.4	22.5	
Legal services	5411	384	(0.0	D		55.2	44.0	0.0		D		58.3	32.0		D	0.0		66.1	33.3	0.0	D	57.6	32.3	
Accounting, tax preparation, bookkeeping, and payroll services	5412	423		D	0.0		67.1	31.4	1.2		D		62.2	35.9		1.2	0.0		62.9	35.9	D	D	71.4	27.0	
Architectural, engineering, and related services	5413	7,090	10	0.2	2.3		61.7	25.8	2.8		0.3		74.8	22.1		3.1	0.4		80.4	16.1	2.2	0.5	81.0	16.3	
Specialized design services	5414	414		D	D		70.5	28.5	0.0		0.0		72.9	27.1		0.0	0.0		72.0	28.0	0.0	0.0	72.9	27.1	
Computer systems design and related services	5415	3,134	4	4.8	2.5	r	58.9	33.8	6.1		1.5	r	65.3	27.1		2.4	1.5	r	65.7	30.4	5.3	0.4	67.2	27.1	
Management, scientific, and technical consulting services	5416	2,057	10	0.2	0.5	r	52.4	36.9	7.8		D		65.5	26.6		7.2	D		62.9	29.6	11.2	0.5	56.7	31.6	
Scientific research and development services	5417	980	-	7.2	2.1		65.5	25.2	7.4		0.9	r	81.9	9.8		6.6	1.7		82.8	8.9	9.2	1.6	80.3	8.9	
Advertising, public relations, and related services	5418	323		D	D		36.2	62.2	D		0.0		45.8	53.3		D	0.0		45.5	54.2	D	D	44.6	54.2	
Other professional, scientific, and technical services	5419	596	8	8.9 r	0.0		62.3	28.8	r D		D		71.1	27.9	r	D	D		75.7	21.0	r 1.5	D	65.1	32.7	
Management of companies and enterprises	55	97	r (0.0	D		46.4	r 0.0	0.0		0.0		100.0	0.0		0.0	0.0		100.0	0.0	0.0	0.0	100.0	0.0	
Administrative and support and waste management and remediation services	56	2,630	16	5.5	3.7	r	48.9	31.0	3.7	r	D		60.3	36.0		3.5 r	D		62.7	33.8	5.6	D	61.7	32.6	

TABLE 105
Impact of robotics technology on worker types, by industry: 2016–18
(Number and percent)

				Production	workers			Nonproduct	ion workers	5		Supervisory	workers		Nonsupervisory workers				
Industry	NAICS code	Companies (number)		d Decreased		Did not employ		d Decrease	Did not change	Did not employ		Decreased	Did not change	Did not employ		Decreased	Did not change		
Educational services	61	581	D	0.0	53.4	46.3	D	0.0	92.4	D	D	0.0	77.6	22.2	D	0.0	92.4	D	
Health care and social assistance	62	11,349	4.9	1.8	63.8	29.5	4.9	2.0	71.1	22.0	4.2	1.1 r	73.1	21.6	5.6	1.9	71.7	20.8	
Health care services	621- 23	11,050	5.0	1.9	64.1	29.0	5.0	2.0	71.6	21.4	4.3	1.1 r	73.2	21.4	5.7	1.9	71.4	21.0	
Social assistance	624	299	0.0	0.0	49.5	50.5	0.0	0.0	58.5	41.5	0.0	0.0	72.2	D	0.0	0.0	86.0	D	
Arts, entertainment, and recreation	71	753	D	D	43.3	43.0	D	D	49.0	37.6	0.0	D	49.4	43.0	D	D	49.0	37.6	
Accommodation and food services	72	3,433	11.8	7.6	57.2	23.4	10.5	D	60.5	27.6	8.9	4.8 r	59.4	26.9	7.7	7.7	49.2	35.5	
Other services	81	4,110	3.6	r 4.7	r 66.7	25.0	1.1	r 3.4	r 69.5	26.0	D	3.1 r	70.7	26.1	2.1 r	2.4 r	70.4	25.1	

D = withheld to avoid disclosing data for individual companies; data are included in higher-level totals. r = relative standard error > 50%.

NAICS = 2017 North American Industry Classification System.

Note(s):

Detail may not add to total because of rounding or unavailable NAICS detail for select records beyond the 4-digit industry classification. Industry classification is based on dominant establishment payroll. Statistics are representative of companies located in the United States.

Source(s):

National Center for Science and Engineering Statistics and Census Bureau, 2019 Annual Business Survey: Data Year 2018.